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# Miscellaneous Notes on Pteridophytes from China and Neighboring Regions (IV)—Validation of Some Combinations in *Diplopterygium* (Pteridophyta: Gleicheniaceae)

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**ABSTRACT.** Some names of *Diplopterygium* widely used in Chinese literature of pteridophytes are not valid; therefore, formal combinations of five names for *Diplopterygium* species from China are validated, i.e., *D. criticum* (Ching & P. S. Chiu) Ching ex X. C. Zhang, *D. rufum* (Ching) Ching ex X. C. Zhang, *D. rufopilosum* (Ching & P. S. Chiu) Ching ex X. C. Zhang, *D. simulans* (Ching) Ching ex X. C. Zhang, and *D. yunnanense* (Ching) Ching ex X. C. Zhang. *Diplopterygium rufopilosum* is lectotyped.

**Key words:** China, *Diplopterygium*, Gleicheniaceae, Pteridophyta.

*Diplopterygium* (Diels) Nakai was traditionally treated as a subgenus of *Gleichenia* Smith (Holttum, 1957, 1959; Tagawa & Iwatsuki, 1979; Tryon & Tryon, 1982), but is now generally accepted as a separate genus (Ching, 1978; Kramer, 1990; Wu & Ching, 1991; Østergaard Andersen & Øllgaard, 2001). The Chinese species of *Diplopterygium* were recorded under the generic name *Hicriopteris* C. Presl (Ching, 1940; Ching et al., 1959). Holttum (1959) discussed the reason why *Hicriopteris* was misused in this sense. The type of *Hicriopteris* was first described as a species of *Dicranopteris* Bernhardt, i.e., *D. speciosa* (C. Presl) Holttum. When Presl (1851) described the genus he compared it with *Gleichenia glauca* (Thunberg) Hooker, a species of *Diplopterygium*. Later authors (Ching, 1940; Copeland, 1947; Ching et al., 1959) thought he was describing a species of *Gleichenia* sect. *Diplopterygium* and consequently misapplied the generic name *Hicriopteris*. *Hicriopteris* is properly a synonym of *Dicranopteris* (see Holttum, 1959; Østergaard Andersen & Øllgaard, 2001).

Three genera of the fern family Gleicheniaceae occur in China: *Diplopterygium* (Diels) Nakai, *Sticherus* C. Presl, and *Dicranopteris* Bernhardt. Plants of *Diplopterygium* can be easily distinguished from those of *Sticherus* by their bipinnate or pinnate-pinnatifid branches, and from *Dicran-*

*opteris* by their dormant buds and rhizomes with scales, veinlets of segments once forked, and sporangia (2)3 to 5(7) per sorus; in *Dicranopteris* the dormant buds and rhizomes with hairs, veinlets of segments 2 to 4 times forked, and sporangia ca. 8 to 25 per sorus (Østergaard Andersen & Øllgaard, 2001) separate it from both *Diplopterygium* and *Sticherus*.

***Diplopterygium*** (Diels) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 47. 1950. *Gleichenia* sect. *Diplopterygium* Diels, in Engler & Prantl, Nat. Pflanzenfam. 1(4): 353. 1900. *Dicranopteris* sect. *Diplopterygium* (Diels) Underwood, Bull. Torrey Bot. Club 34: 251. 1907. *Gleichenia* subg. *Diplopterygium* Holttum, Reinwardtia 4: 261. 1957. TYPE: *Diplopterygium glaucum* (Thunberg ex Houttuyn) Nakai (*Polypodium glaucum* Thunberg ex Houttuyn).

*Diplopterygium* contains about 25 species, from Asia to Queensland, Australia, and Polynesia (including Hawaii), mainly in tropical Asia, not in Africa. A single species, *D. bancroftii* (Hooker) A. R. Smith, occurs in tropical America.

Ching et al. (1959) recorded 16 species of *Diplopterygium* under the generic name *Hicriopteris* from China and one from northern Vietnam, the region bordering China. Six of these already have been transferred into *Diplopterygium*, including:

***Diplopterygium blotianum*** (C. Christensen) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 49. 1950.

***Diplopterygium cantonense*** (Ching) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 49. 1950.

***Diplopterygium chinense*** (Rosenstock) De Vol, in H. L. Li et al., Fl. Taiwan 1: 92. 1975, "chinensis."

***Diplopterygium giganteum*** (Wallich ex Hooker) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 50. 1950.

***Diplopterygium glaucum*** (Thunberg ex Hout-

tuyn) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 51. 1950.

**Diplopterygium laevissimum** (H. Christ) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 52. 1950.

Ching (in Shing, 1982) published numerous combinations for Chinese species of *Diplopterygium*, but these were not validated properly according to Article 33.3 of the ICBN (Greuter et al., 2000). Two of these were validated later, i.e., *Diplopterygium maximum* Ching & H. S. Kung (in Kung, 1988: 134), and *Diplopterygium glaucoides* (Ching) Ching ex P. S. Wang & X. Y. Wang (in Wang & Wang, 2001: 279). Some of them are presently regarded as synonyms of various species and therefore need not be transferred into *Diplopterygium*.

The following five combinations for *Diplopterygium* are formally proposed here in order to solve the nomenclatural problems of these Chinese species and for the revision of fern flora of China.

**Diplopterygium criticum** (Ching & P. S. Chiu) Ching ex X. C. Zhang, comb. nov. Basionym: *Hicriopteris critica* Ching & P. S. Chiu, in S. S. Chien & Chun, Fl. Reipubl. Popul. Sin. 2: 348. 1959. *Diplopterygium criticum* (Ching & P. S. Chiu) Ching, in K. H. Shing, Gloss. Term. Nam. Ferns 50. 1982, nom. inval. TYPE: China. Yunnan: Pingbian, Dawei Shan, R. C. Ching 55 (holotype, PE).

**Diplopterygium rufum** (Ching) Ching ex X. C. Zhang, comb. nov. Basionym: *Hicriopteris rufa* Ching, in S. S. Chien & Chun, Fl. Reipubl. Popul. Sin. 2: 347. 1959. *Diplopterygium rufum* (Ching) Ching, in K. H. Shing, Gloss. Term. Nam. Ferns 50. 1982, nom. inval. TYPE: China. Yunnan: Pingbina, Dawei Shan, K. M. Feng 4832 (holotype, PE).

The collection number was misprinted as 4823 when the species was published, but on the label of the type in PE the number is 4832.

**Diplopterygium rufopilosum** (Ching & P. S. Chiu) Ching ex X. C. Zhang, comb. nov. Basionym: *Hicriopteris rufopilosa* Ching & P. S. Chiu, in S. S. Chien & Chun, Fl. Reipubl. Popul. Sin. 2: 348. 1959, "rufo-pilosa." *Diplopterygium rufopilosum* (Ching & P. S. Chiu) Ching, in K. H. Shing, Gloss. Term. Nam. Ferns 50. 1982, "refo-pilosum," nom. inval. TYPE: China. Yunnan: Dali, Cang Shan, C. Y. Wu 11825 (lectotype, designated here, PE).

A second syntype, H. C. Wang 3541 (PE), is of

a young sterile plant, but C. Y. Wu 11825 is a fertile plant; therefore, it is selected as the lectotype.

**Diplopterygium simulans** (Ching) Ching ex X. C. Zhang, comb. nov. Basionym: *Hicriopteris simulans* Ching, Acta Phytotax. Sin. 8: 133, 161. 1959. *Diplopterygium simulans* (Ching) Ching, in K. H. Shing, Gloss. Term. Nam. Ferns 50. 1982, nom. inval. TYPE: China. Hainan: C. Wang 35496 (holotype, PE).

**Diplopterygium yunnanense** (Ching) Ching ex X. C. Zhang, comb. nov. Basionym: *Hicriopteris yunnanensis* Ching, in S. S. Chien & Chun, Fl. Reipubl. Popul. Sin. 2: 350. 1959. *Diplopterygium yunnanense* (Ching) Ching, in K. H. Shing, Gloss. Term. Nam. Ferns 50. 1982, nom. inval. TYPE: China. Yunnan: Jingdong, Wuliang Shan, W. H. Hsu 6 (holotype, PE).

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